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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,751	02/22/2002	Brian C. Banister	LSI-004-CIP	8423

7590 09/26/2006  
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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/080,751

Applicant(s)

BANISTER, BRIAN C.

Examiner

Kevin M. Burd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-13, 19, 24 and 25 is/are rejected.
- 7) ☒ Claim(s) 6-8, 14-18, 20-23 and 26-40 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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1. This office action, in response to the amendment filed 7/10/2006, is a non-final office action.

### ***Response to Arguments***

2. The claim objection to claim 26 is withdrawn in view of the amendment. A new claim objection to claim 34 appears below necessitated by the amendment.
3. Applicant's arguments, see pages 13-14 and 16-19 of the remarks filed 7/10/2006 regarding the rejection of the claims under 35 USC 102(e) as being anticipated by Harrison et al (US 6,434,366) has been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, new grounds of rejection are made in view of Raleigh et al (US 6,144,711). In addition, a new rejection under 35 USC 101 is stated below.
4. The previous double patenting of the claims is withdrawn.
5. Applicant's arguments regarding the rejection of claim 46 under 35 USC 112, first paragraph is withdrawn. A new rejection of claim 46 under 35 USC 112, first paragraph is stated below.

### ***Claim Objections***

6. Claim 34 is objected to because of the following informalities: it is unclear which sub-act d the claim is referring to: step D stated in claim 34 or act d disclosed in claim 24. Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claim 46 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The computer program is not embodied on a computer readable storage medium. When function descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 46 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 46 claims a computer program executable on a general computing device. However, this program is not disclosed in the specification. Figures 4-6 disclose the apparatus and method of using the apparatus. The apparatus is shown in hardware and there is no mention of implementing the

method in software. In addition, there is no disclosure discussing the computer readable storage medium the computer program is embodied on. The program is executable on a computing device. However, as stated above, the method for using the hardware in figures 4-6 does not disclose storing instructions. A user could input instructions and those instructions can be sent to the transmitter for implementing the instructions claimed. In this case, the computer readable medium would be an electromagnetic signal. A signal encoded with functional descriptive material does not fall within any of the categories of patentable subject matter set forth in 35 USC 101. In addition, the instructions could be printed on a sheet of paper and fed into an optical scanner and an apparatus could carry out those instructions, in this case, the recording medium containing computer readable instructions to perform a method would be a sheet of paper. A mere arrangement of printed material, though seemingly a "manufacture," is rejected as not being within the statutory classes (MPEP 706.03(a)). Therefore, since there is no disclosure in the specification as originally filed disclosing the computer program embodied on a computer readable storage medium, the claims are rejected under 35 USC 112, 1<sup>st</sup> paragraph as failing to comply with the written description requirement.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-5, 9-13, 19, 24-25 and 41-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Raleigh et al (US 6,144,711).

Regarding claims 1, 24, 43 and 44, Raleigh discloses an apparatus and a method of using the apparatus for generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers (figure 9), and wherein the transmitter includes a plurality of antennas (figure 11). A parameter set is initialized to some starting value (the reciprocity in a radio link that allows the undesired receive interference subspace in each SOP bin to be accurately used to describe the transmitter subspace) (column 21, lines 33-51). A weight vector is set to some initial value (column 6, line 66 to column 7, line 4). The transmitter spatial vector weights within each SOP bin increases the power delivered to the desired receiver within one or more spatial subchannels while reducing interference radiated to unintended receivers (column 6, line 66 to column 7, line 4). This transmission will change the undesired receiver interference and therefore change the parameter set. This process will be repeated until the interference radiated to unintended receivers is removed or the transmission is complete.

Regarding claims 2, 3 and 25, updating of the weight vector is based upon feedback from the receivers (column 21, lines 33-51).

Regarding claim 4, Raleigh discloses the system is a multiple access communication system (column 36, lines 6-16).

Regarding claim 5, Raleigh discloses the transmitter spatial vector weights within each SOP bin increases the power delivered to the desired receiver within one or more spatial subchannels while reducing interference radiated to unintended receivers (column 6, line 66 to column 7, line 4).

Regarding claim 9, the receive and transmit channels are estimated (column 29, lines 48-64) and the complex path gain of the matrix channel is used (column 4, lines 12-25).

Regarding claims 10, 12 and 13, updating of the weight vector is based upon feedback from the receivers (column 21, lines 33-51).

Regarding claims 11 and 19, the updating of the weight vector is based upon feedback from the receivers (column 21, lines 33-51).

Regarding claims 41 and 45, Raleigh discloses an apparatus and method of using the apparatus for generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers (figure 9), and wherein the transmitter includes a plurality of antennas (figure 11). Channel estimates are initialized to some starting value (the reciprocity in a radio link that allows the undesired receive interference subspace in each SOP bin to be accurately used to describe the transmitter subspace) (column 21, lines 33-51). A weight vector is set to some initial value (column 6, line 66 to column 7, line 4). The transmitter spatial vector weights within each SOP bin increases the power delivered to the desired receiver within one or more spatial subchannels while reducing interference radiated to unintended receivers (column 6, line 66 to column 7, line 4).

This transmission will change the undesired receiver interference and therefore change the channel estimates. This process will be repeated until the interference radiated to unintended receivers is removed or the transmission is complete.

Regarding claim 42, Raleigh discloses an apparatus for generating weighted transmit signals with nulling in a communication system, wherein the communication system includes a transmitter and a plurality of receivers (figure 9), and wherein the transmitter includes a plurality of antennas (figure 11). A parameter set is initialized to some starting value (the reciprocity in a radio link that allows the undesired receive interference subspace in each SOP bin to be accurately used to describe the transmitter subspace) (column 21, lines 33-51). A weight vector is set to some initial value (column 6, line 66 to column 7, line 4). The transmitter spatial vector weights within each SOP bin increases the power delivered to the desired receiver within one or more spatial subchannels while reducing interference radiated to unintended receivers (column 6, line 66 to column 7, line 4). This transmission will change the undesired receiver interference and therefore change the parameter set. This process will be repeated until the interference radiated to unintended receivers is removed or the transmission is complete. The system comprises a transmitter and a receiver capable of the claimed functions. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed



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apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

"[A]pparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (emphasis in original). See MPEP 2114.

### ***Allowable Subject Matter***

10. Claims 6-8, 14-18, 20-23 and 26-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The indicated allowability of claims 5 and 11 is withdrawn in view of the newly discovered reference to Raleigh et al (US 6,144,711). Rejections based on the newly cited reference are stated above.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Foschini et al (US 6,888,809) discloses a communication system shown in figures 1 and 2. The transmitter is shown in figure 1. The transmit weights are weights are a function of the estimate interference covariance matrix and the forward matrix channel response between the transmitter and the receiver (column 9, lines 32-

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53). The reverse channel provides feedback from the receiver to the transmitter as shown in figure 1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin M. Burd  
9/21/2006

  
**KEVIN BURD**  
**PRIMARY EXAMINER**